

# Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <a href="http://about.jstor.org/participate-jstor/individuals/early-journal-content">http://about.jstor.org/participate-jstor/individuals/early-journal-content</a>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

# SCIENCE

[Entered at the Post-Office of New York, N.Y., as Second-Class Matter.]

# A WEEKLY NEWSPAPER OF ALL THE ARTS AND SCIENCES.

SEVENTH YEAR. Vol. XIV. No. 359

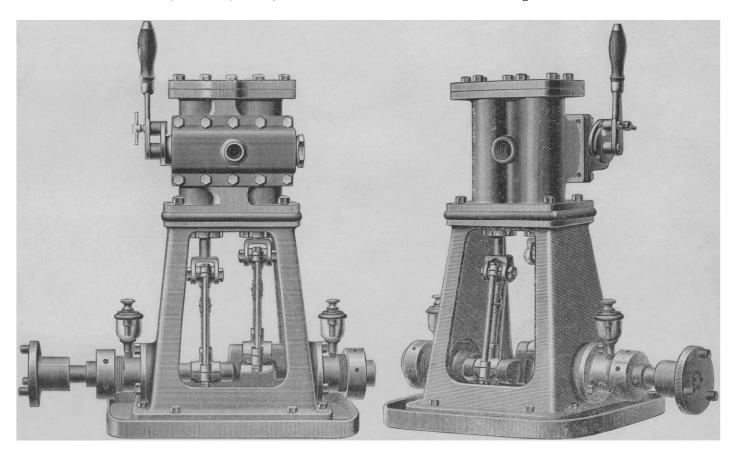
NEW YORK, DECEMBER 20, 1889

SINGLE COPIES, TEN CENTS. \$3.50 PER YEAR, IN ADVANCE.

### THE SHORTT HIGH-SPEED ENGINE.

THE new type of steam-engine illustrated on this and the following page possesses several points that will naturally attract the attention of engineers and steam-users generally. There are features about it that will specially commend it to marine engineers and yacht-owners, as well as to others interested in compact high-speed reversible engines giving a maximum of efficiency with a minimum of fuel, and as free from complication of parts as possible.

results as to strength and stiffness are got from a given weight of metal. The pistons are double-acting; that is, steam is admitted to them at each end of the stroke. An engine of this type, with cylinders two inches in diameter and two-inch stroke, will develop two horse-power under ordinary conditions, but with high steam-pressure it is capable of doing much more. A launch engine of this size and power, running at four hundred revolutions a minute, has been used to run a twenty-five foot launch during the past year with excellent results. Though the model of the boat is not one



FIGS. 1 AND 2. - THE SHORTT DUPLEX HIGH-SPEED ENGINE.

The engine shown in the illustrations is known as the Shortt duplex high-speed engine, and it is being placed on the market by the Hussey Re-heater and Steam Plant Improvement Company of this city. Figs. I and 2 are perspective views of a reversing engine designed more especially for steam-launch and yacht service. Fig. 3 is a section showing the frame, cylinder and piston, steam-valve, connecting-rod, etc. It will be observed that there are two cylinders and a double crank, the crank-pins being set at an angle of ninety degrees with each other, thus preventing the engine from ever being on a dead-centre. The cylinders are made in one casting, and are supported on a frame of A-pattern, in which the best

calculated for speed, it is said to have run along easily and continuously at a rate of ten miles an hour.

The valves, though cylindrical in form, are the same as the regular slide-valve in action and principle. They take their motion from the pistons, the piston and valve of the right-hand cylinder controlling the admission and cut-off of steam to the left-hand cylinder, and  $vice\ versa$ , the steam ports being crossed. Fig. 4 is a diagram of the valve-seat and ports, the dotted lines showing the crossed steam-passages. The steam-ports are designated by the letter D, and the exhaust ports by C. The valves are shown in Fig. 5, E being the reversing-valve, and E the main valves. The

steam-passages are shown at G, and the exhaust-passages at H. The reversing-valve acts inside the main valve, the reversal of the engine being effected by giving the inner valve a half-revolution in

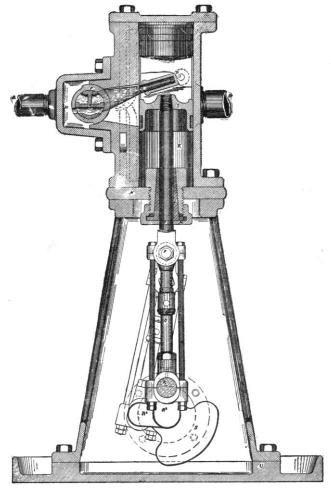
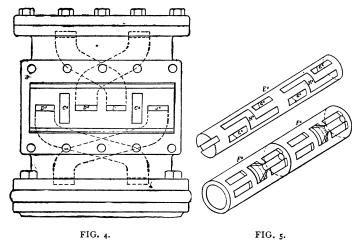


FIG. 3.

the outer valve, thereby changing the register of the steam-passages. The reversing-lever is shown in the plan of the valve-seat, Fig. 6. A cross-section of one of the main bearings with antifriction metallic bushing is shown at Fig. 7. These bearings are



conical, and milled through, so that all wear may be easily and quickly taken up by turning the adjusting nut on the bearing casing. The connecting-rods are of the skeleton pattern, with self-oiling bronze boxes lined with anti-friction metal.

These engines are made by special tools in such a way as to insure that all like parts are interchangeable, thus facilitating repairs. The plain non-reversible engine made by the same manufacturers is the same as the engine shown, except that it has no reversing-

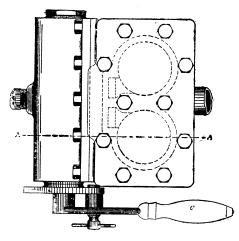


FIG. 6.

valve, and is provided with a pulley on the shaft instead of a coupling. In the larger sizes of these engines they will be made compound, and also automatic, special attention being paid to their adaptability for electric lighting and similar purposes. Among the advantages claimed for this engine are that it is economical,

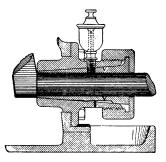


FIG. 7.

light, durable, simple in construction, and easy to operate, having no links, eccentrics, valve-stems, stuffing-boxes, nor dead-centres. It is said to afford greater power in smaller space than any other engine ever constructed, and to have the most positive valve-gear ever designed.

## ELECTRICAL NEWS.

NEW INSULATING COMPOUND. — A new insulating compound which finds favor among manufacturers of electrical instruments and machinery in France consists of one part of Greek pitch and two parts of burnt plaster by weight, the latter being pure gypsum raised to a high temperature and plunged in water. The mixture, when hot, is a paste, and can be applied by a brush or cast in moulds. It is amber-colored, and can be turned and polished. Its advantage is said to be endurance of great heat and moisture without injury to its insulating properties.

ELECTRIC TRACTION. — A large and appreciative audience listened to the reading of a paper by S. Dana Greene, on the "Development of Electric Street-Car Traction," at a meeting of the New York Electrical Society on Dec. 11. In Mr. Greene's opinion, the storage-battery system of electric traction is the ideal one for roads of easy grades, though it is yet far from perfect. He predicts, however, that a few years more will develop a wonderful increase in its efficiency and reliability.